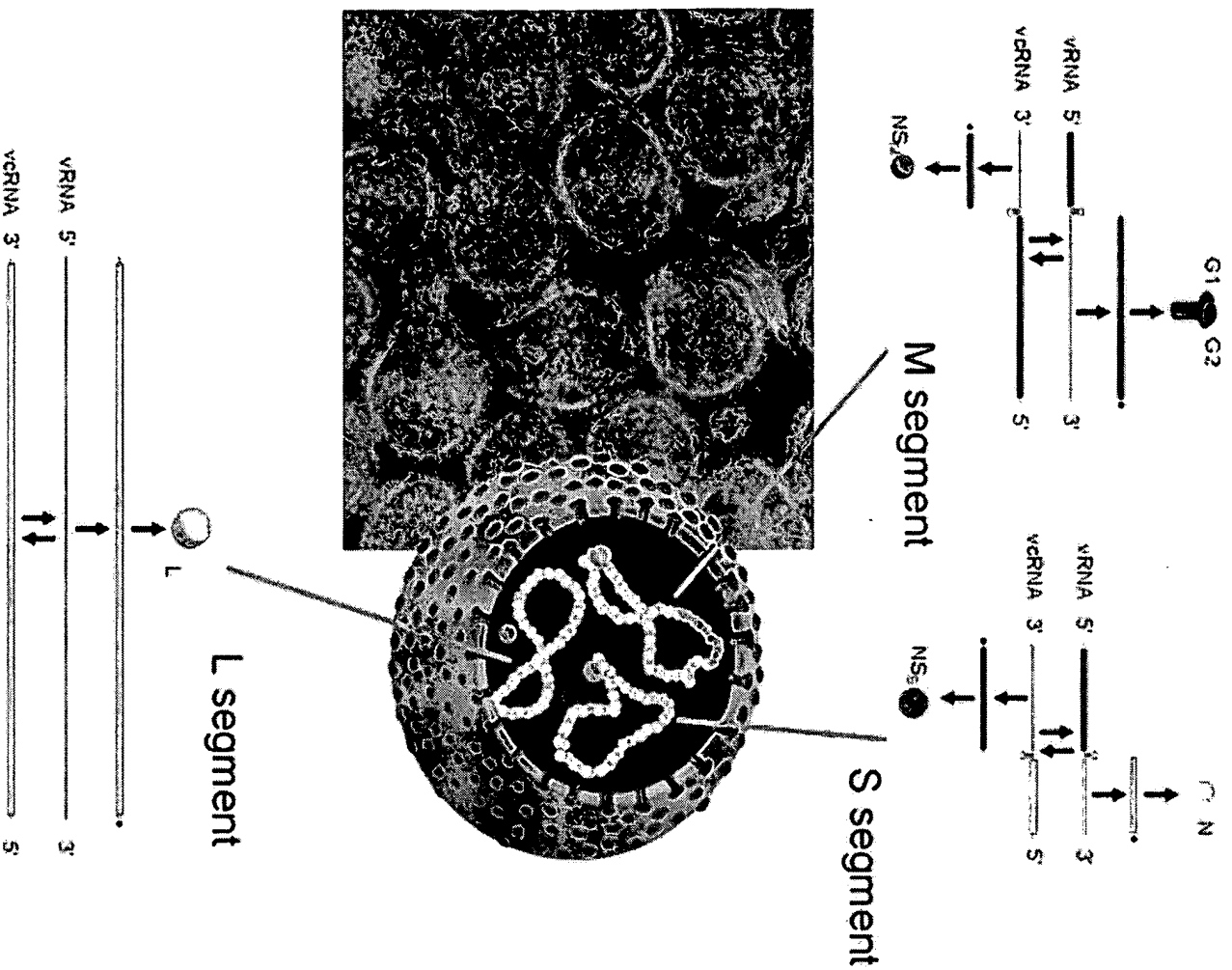


# TSWV



The five genes of TSWV:

L polymerase

NS<sub>M</sub> movement protein

G1/G2 glycoproteins

N nucleocapsid

NS<sub>S</sub> virulence factor



# TSWV suppresses gene silencing

GFP silenced

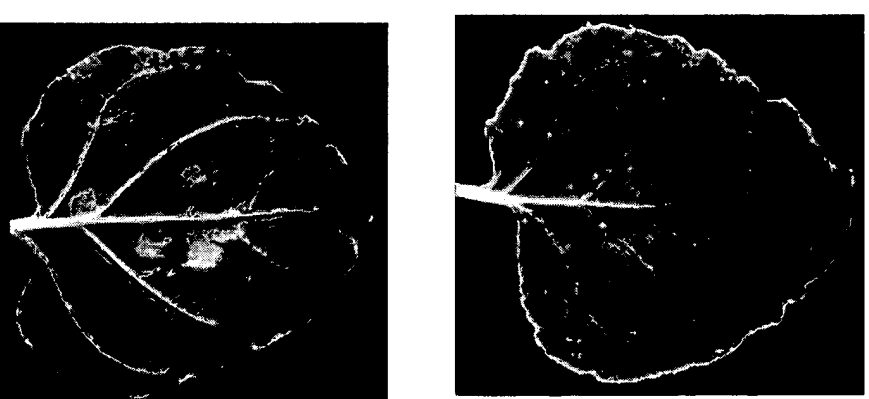
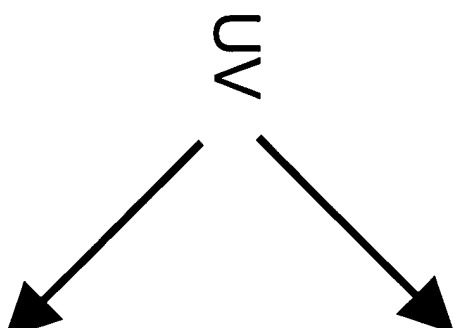
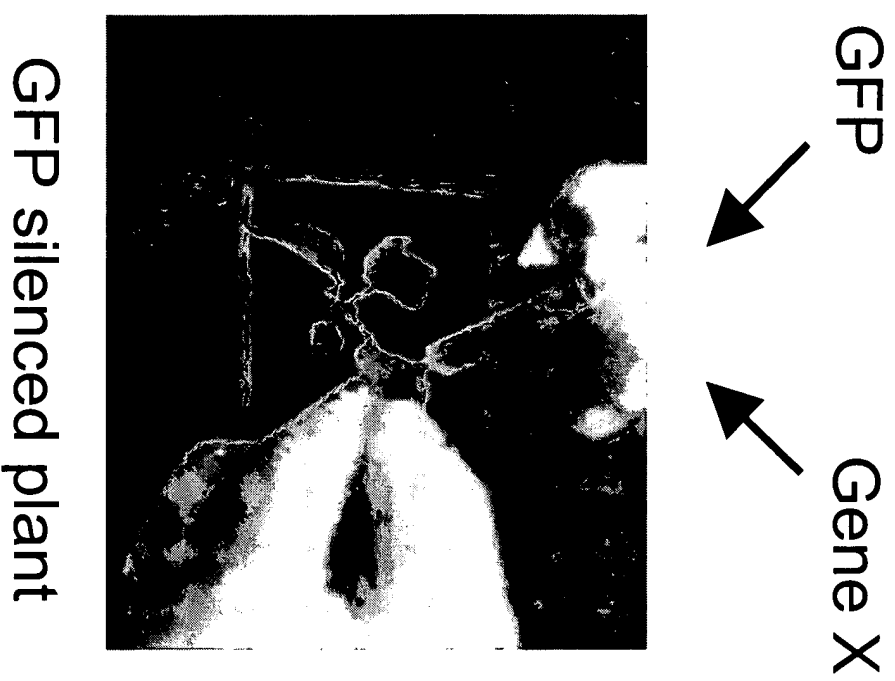


TSWV inoculated

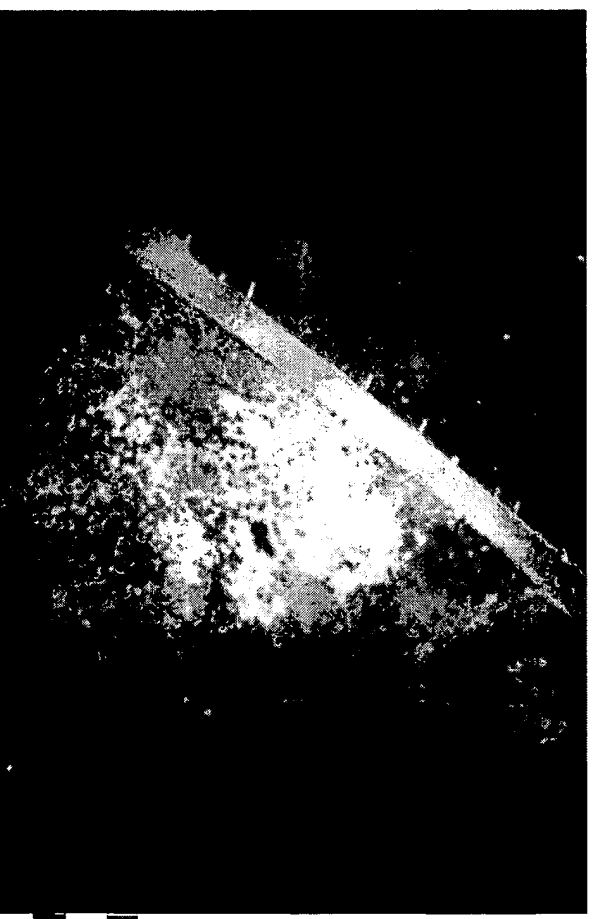
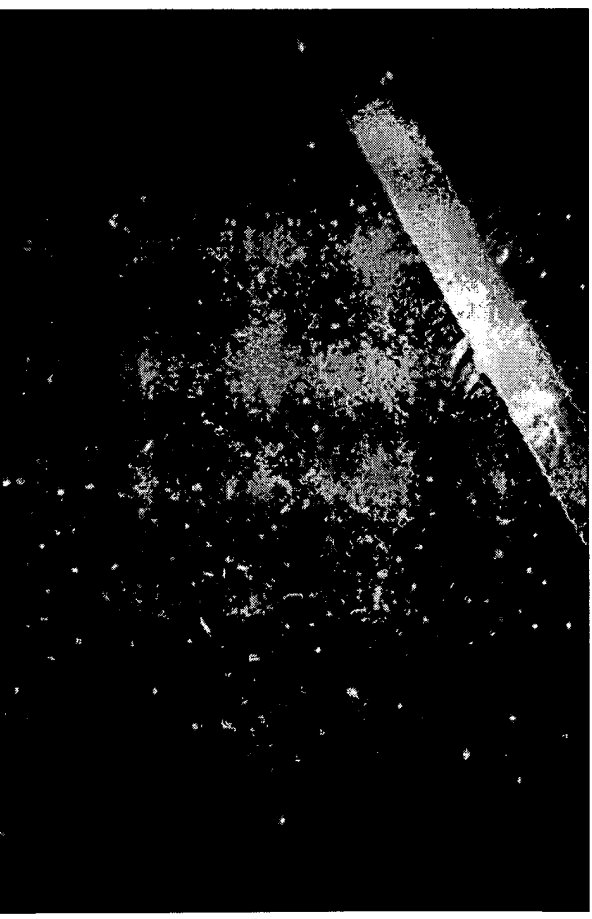
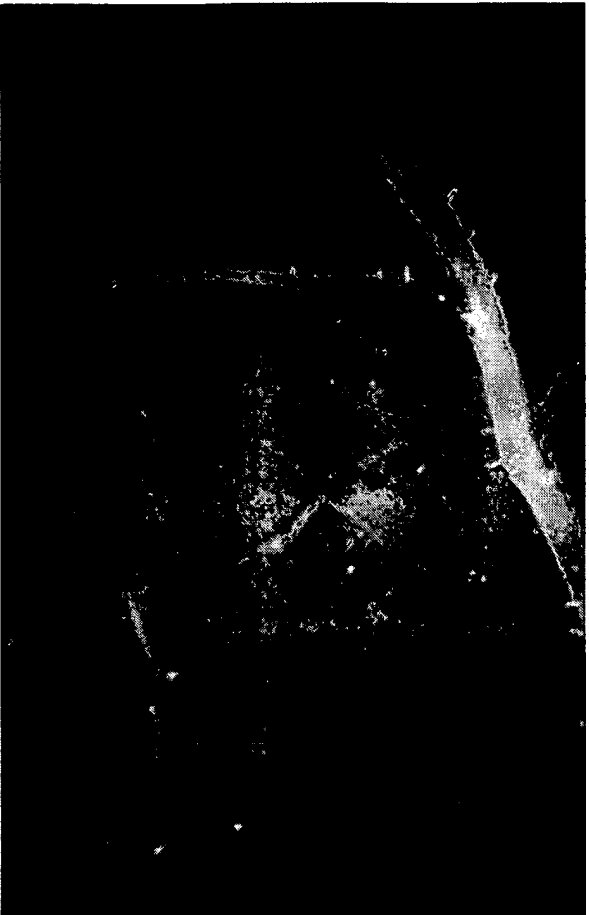


# How to identify a potential silencing suppressor

Agroinfiltration:

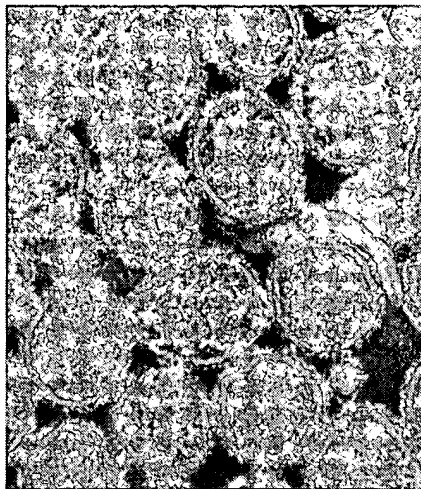


# **NS<sub>s</sub> suppresses GFP gene silencing**

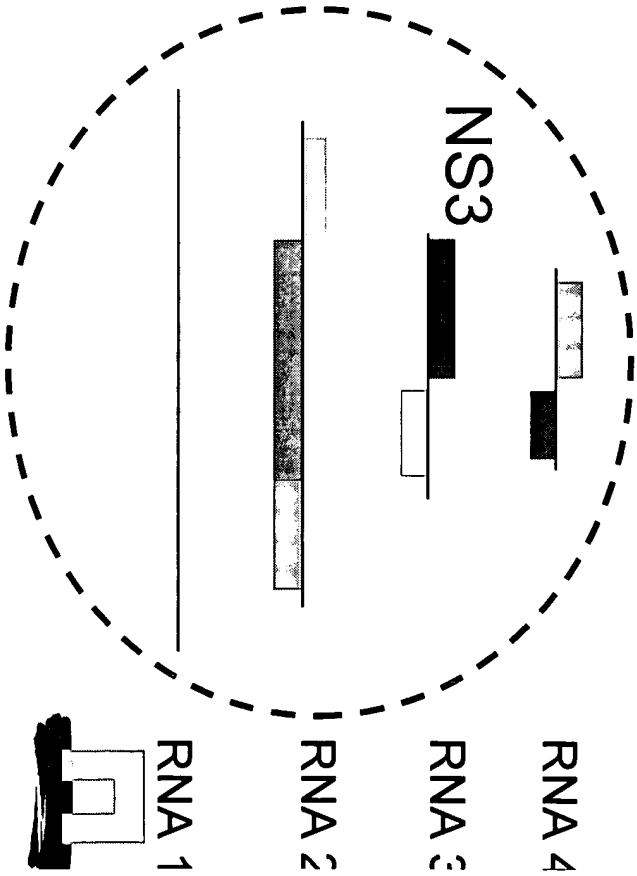
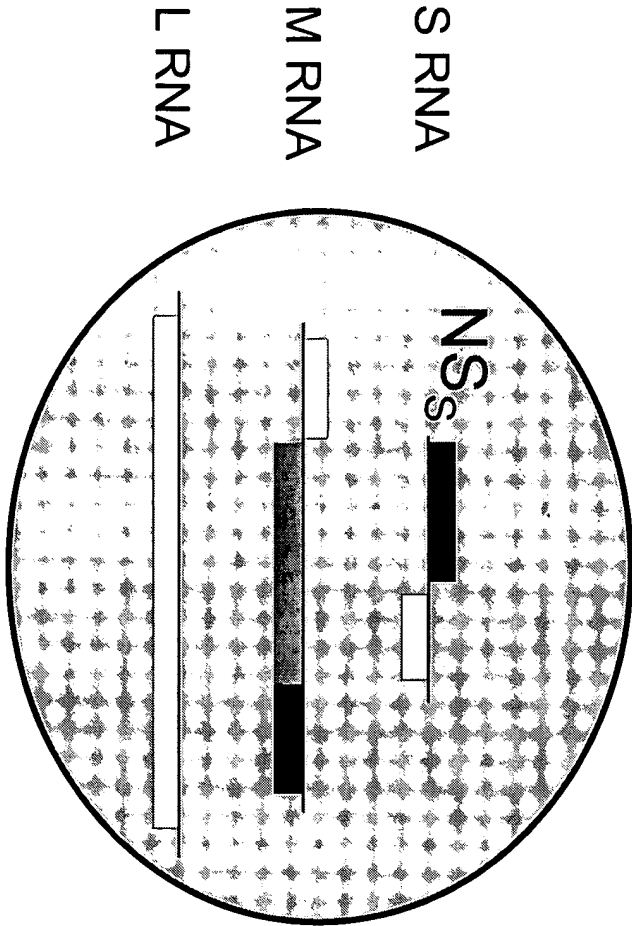
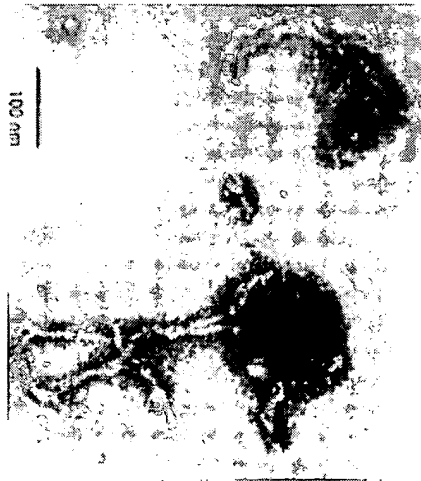


# The NS<sub>s</sub> paralogue of RHBV: NS3

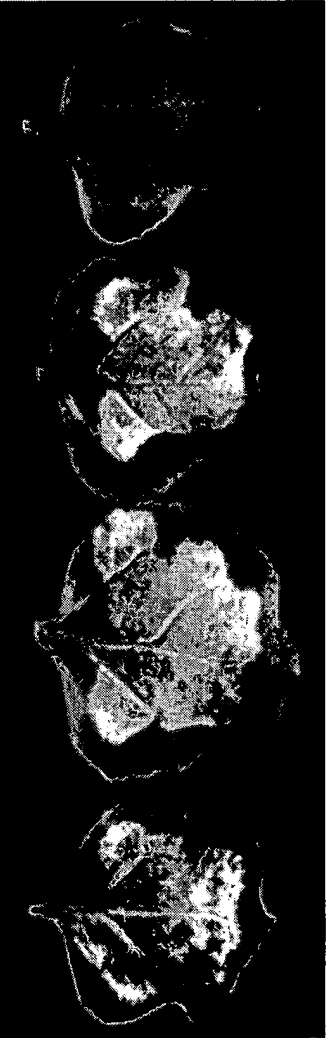
TSWV



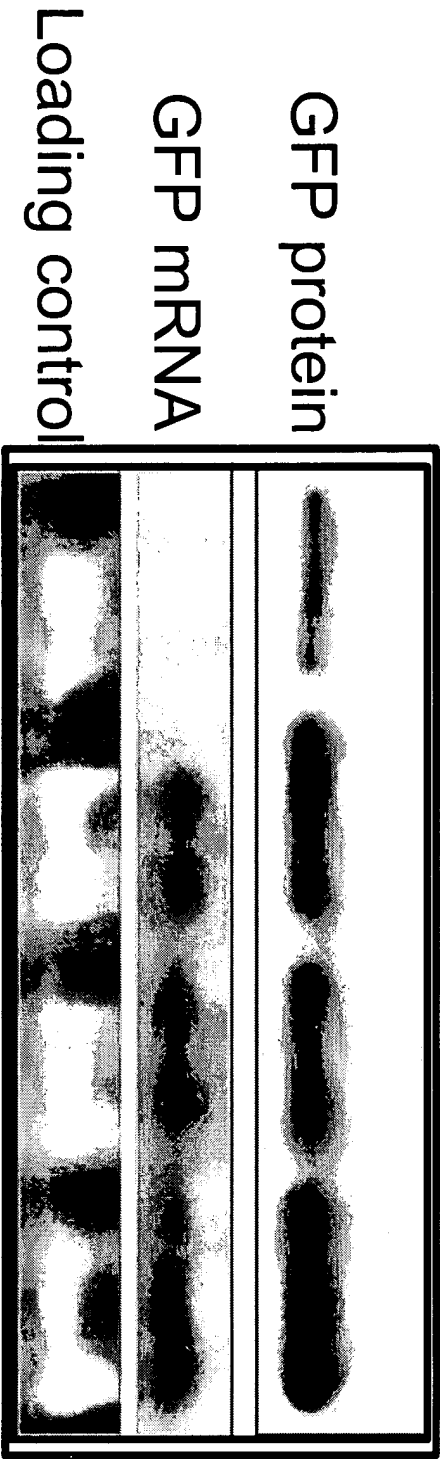
RHBV  
Rice hoja blanca tenuivirus



# Suppression in non-transgenic plants



GFP    GFP+HC-Pro    GFP+NS<sub>s</sub>    GFP+NS3  
 (PVY)    (TSWV)    (RHBV)



siRNAs



25 nt  
 24 nt  
 23 nt  
 22 nt



## An increasing list of characterized silencing suppressors

<b>Virus</b>	<b>Genus</b>	<b>Genome</b>	<b>Suppression</b>	<b>Protein</b>
<b>ACMV</b>	<b>Begomovirus</b>	<b>DNA</b>	<b>complete</b>	<b>AC2</b>
<b>BSMV</b>	<b>Hordeivirus</b>	<b>(+) RNA</b>	<b>complete</b>	<b>gb</b>
<b>BWYV</b>	<b>Polerovirus</b>	<b>(+) RNA</b>	<b>complete</b>	<b>P0</b>
<b>CMV</b>	<b>Cucumovirus</b>	<b>(+) RNA</b>	<b>partial/systemic</b>	<b>2b</b>
<b>CPMV</b>	<b>Comovirus</b>	<b>(+) RNA</b>	<b>partial</b>	<b>?</b>
<b>PCV</b>	<b>Furovirus</b>	<b>(+) RNA</b>	<b>complete</b>	<b>P15</b>
<b>PVX</b>	<b>Potexvirus</b>	<b>(+) RNA</b>	<b>partial/systemic</b>	<b>P25</b>
<b>PVY</b>	<b>Potyvirus</b>	<b>(+) RNA</b>	<b>complete</b>	<b>HC-Pro</b>
<b>RHBV</b>	<b>Tenuivirus</b>	<b>(-) RNA</b>	<b>complete</b>	<b>NS3</b>
<b>RYMV</b>	<b>Sobemovirus</b>	<b>(+) RNA</b>	<b>complete</b>	<b>P1</b>
<b>CymRSV</b>	<b>Tombusvirus</b>	<b>(+) RNA</b>	<b>complete</b>	<b>P19</b>
<b>TSWV</b>	<b>Tospovirus</b>	<b>(-) RNA</b>	<b>complete</b>	<b>NSs</b>



## Conclusions

TSWV (and other tospoviruses) inhibit gene silencing

NS<sub>s</sub> stands for suppressor of gene silencing

NS<sub>s</sub> boosts expression of GFP in (non-)transgenic plants  
(like HC-Pro)

The RHBV NS3 paralogue of NS<sub>s</sub> also shows 'HC-Pro-like'  
suppression of gene silencing

Negative strand plant viruses encode gene silencing  
suppressors

